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10/788,639	02/27/2004	Per-Ola Kristensson	ARC920040008US1	7219

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EXAMINER	
LEE, JOHN W	

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/788,639	KRISTENSSON ET AL.	
	Examiner	Art Unit	
	JOHN Wahnkyo LEE	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) *9,15,16,20,29,33,34,36 and 39* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8, 10-14, 17-19, 21-28, 30-32, 35, 37-38 and 40-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The original presentation will be withdrawn which was mentioned on the previous office action mailed on 4 December 2008. A new office action will be provided considering all the claims.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-8, 10-14, 17-19, 21-27 and 37-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kristensson ("Design and Evaluation of a Shorthand Aided Soft Keyboard") in view of Kawamura et al. (US 2002/0071607).

Regarding claim 1, Kristensson discloses a method of recognizing words (chapter 3.6, "SHARK system"), comprising: defining word patterns of a plurality of known words by a plurality of paths (chapter 3.7.1, "word level gestures"; Appendix D), wherein each path connects elements in a word on a virtual keyboard (chapter 3.7.1, "spatial relations with the individual characters position on the keyboard"), wherein the virtual keyboard contains a set of characters forming elements in the word without temporary target letters being placed adjacent to a current stroke location (chapter 3.7.1, "do not contain … reproduce an exact pattern on the keyboard"); accepting a stroke as an input on the virtual

keyboard layout (chapter 3.7.1, "… shorthand gestures … keyboard"); and processing the stroke using a combination of a plurality of channels (chapter 6.1.2, "partial location dependence; chapter 4, "shape") that selectively process different aspects of the stroke in relation to the plurality of the paths on the virtual keyboard (chapter 3.7.1, "spatial relations with the individual characters position on the keyboard"). However, Kristensson does not disclose all the claim limitations. Instead of Kristensson, Kawamura discloses converting (paragraph [0099], "character segmenting result") each different aspects of the stroke's (paragraph [0099], "strokes") similarity *paragraph [0099], "… corresponding ...") to probability estimates (paragraph [0099], "probability (likelihood"); And mathematically integrating the probability (equation (1); "probability density function") estimates of the plurality of channels to produce integrated probability estimates of candidate words (paragraph [0163], "... calculation of likelihood").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kawamura's invention in Kristnesson's invention to automatically recognize characters as suggested by Kawamura (paragraph [0013]).

Regarding claim 2, Kristensson further discloses wherein the plurality of channels comprising normalized shape information (chapter 4, "shape") independent of location and scale (Section 4.3.1, "Non-destructive interpolation" and "the shape does not consider location or scale").

Regarding claim 3, Kristensson further discloses wherein the plurality of channels comprising path location information (chapter 6.1.2, "partial location

dependence") regarding sample point of the stroke, each sampling point having a weight (Section 4.3.1, "Non-destructive interpolation").

Regarding claim 4, Kristensson further discloses wherein the plurality of channels comprising a tunnel model channel (Appendix B; Figure B-2, "notepad GUI").

Regarding claim 5, Kristensson further discloses wherein the plurality of channels comprising a language context channel (Appendix D).

Regarding claim 6, Kristensson further discloses wherein recognizing the word pattern using the normalized shape information comprising template matching (chapter 4.1.1, "prototype").

Regarding claim 7, Kristensson further discloses wherein recognizing the word pattern using the normalized shape information comprising feature extraction (chapter 4.1.1, "prototype space" and "prototype feature vectors").

Regarding claim 8, Kristensson further discloses wherein recognizing the word pattern using location information comprises using location matching (chapter 4.2.2.1, "elastic matching of two curves"), wherein location matching comprising weighting sampling points of location from beginning to end (chapter 4.3.1, equations (4.10) and (4.11), "Euclidean distance").

Regarding claim 10, Kristensson further discloses wherein a tunnel of the word pattern comprising a predetermined width on either side of a set of virtual keys representing a set of letters of the word on a virtual keyboard (Appendix B; Figure B-2, "notepad GUI").

Regarding claim 11, Kristensson discloses wherein recognizing the word pattern using the tunnel model channel comprises traversing keys passed by the word pattern and identifying potential word candidates by partial string matching (Appendix B; Figure B-2, “notepad GUI”).

Regarding claim 12, Kristensson discloses wherein recognizing the word pattern using the tunnel model channel comprises transforming a tunnel and a gesture passing the tunnel (Appendix B; Figure B-2, “notepad GUI”).

Regarding claim 13, Kristensson discloses wherein recognizing the shape comprising recognizing a difference between a user's gesture trace and an ideal template of the pattern (chapter 4.4, “Recognition Engine”; Appendix C, “Recognizer”).

Regarding claim 14, Kristensson discloses further comprising displaying the difference between the user's gesture trace and the ideal template of the pattern by morphing the user's gesture trace to the ideal template (chapter 4.2.2.1, “elastic matching of two curves”).

Regarding claim 17, Kristensson discloses further comprising analyzing the stroke to differentiate between a tapping and a shorthand gesture input ; and inputting at least one letter of a word by tapping the letter (chapter 3.7.3, “novice” and “expert”).

Regarding claim 18, Kristensson discloses further comprising comparing a normalized word pattern and a normalized gesture trace and sampling the normalized word pattern and gesture trace to a fixed number of a plurality of points; and measuring the plurality of points relative to each other (chapter

4.2.2.1, “elastic matching of two curves”; chapter 4.3.1, equations (4.10) and (4.11), “Euclidean distance”; chapter 4.4.1; Figure 4-12, “normalization”).

Regarding claim 19, Kristnesson discloses comprising comparing a feature vector of the gesture trace and the feature vector of a word pattern (chapter 4.1.1, “prototype space” and “prototype feature vectors”).

Regarding claims 21-25, claims 21-25 are analogous and correspond to claims 1-5, respectively. See rejections of claims 1-5 for further explanation.

Regarding claim 26, claim 26 is analogous and corresponds to claims 2-5. See rejection of claims 2-5 for further explanation.

Regarding claim 27, claim 27 is analogous and corresponds to claim 15. See rejection of claim 15 for further explanation.

Regarding claim 28, Kawamura further discloses wherein the word letters comprising letters from Chinese pinyin characters (paragraph [0139], “Chinese characters”).

Regarding claims 37, Regarding claim 1, Kristensson discloses a method of recognizing words (chapter 3.6, “SHARK system”), comprising: defining word patterns of a plurality of known words by a plurality of paths (chapter 3.7.1, “word level gestures”; Appendix D), wherein each path connects elements in a word on a virtual keyboard (chapter 3.7.1, “spatial relations with the individual characters position on the keyboard”), wherein the virtual keyboard contains a set of characters forming elements in the word without temporary target letters being placed adjacent to a current stroke location (chapter 3.7.1, “do not contain … reproduce an exact pattern on the keyboard”); accepting a stroke as an input on

the virtual keyboard layout (chapter 3.7.1, "… shorthand gestures … keyboard"); and recognizing a word pattern by processing the stroke using a combination of a plurality of channels (chapter 6.1.2, "partial location dependence; chapter 4, "shape") that selectively process different aspects of the stroke in relation to the plurality of the paths on the virtual keyboard (chapter 3.7.1, "spatial relations with the individual characters position on the keyboard"). However, Kristensson does not disclose all the claim limitations. Instead of Kristensson, Kawamura discloses at least one location channel (paragraph [0099], "character segmenting result") processing a location-based (paragraph [0207], "character string") similarity (paragraph [0099], "… corresponding ...") to probability estimates (paragraph [0099], "probability (likelihood"); determining a time spent inputting the stroke (paragraph [0207], "every time one stroke is inputted"); and modifying the location-based (paragraph [0207], "character string") similarity (paragraph [0099], "… corresponding ...") probability estimate (paragraph [0099], "probability (likelihood") to a path of the stroke on the virtual keyboard (chapter 3.7.1, "spatial relations with the individual characters position on the keyboard") and the time spent inputting the stroke (paragraph [0207], "every time one stroke is inputted") to produce an output (paragraph [0204], "display") of the at least one location channel (paragraph [0207], "character string").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kawamura's invention in Kristenesson's invention to automatically recognize characters as suggested by Kawamura (paragraph [0013]).

Regarding claims 38 and 40-41 are analogous and correspond to claims 2 and 4-5, respectively. See rejection of claims 2 and 4-5 for further explanation.

Regarding claims 42, claim 42 is analogous and corresponds to claims 2-5. See rejections of claims 2-5 for further explanation.

Regarding claim 43, Kristensson further discloses 43. (Withdrawn) The method of claim 1, including ranking the candidate words in order of probability (section 3.4.1, "… rank"; equation 3.1).

Regarding claim 44, Kawamura further discloses determining a time spent inputting the stroke (paragraph [0207], "every time one stroke is inputted"); and modifying the location-based (paragraph [0207], "character string") similarity (paragraph [0099], "… corresponding ...") probability estimate (paragraph [0099], "probability (likelihood") to a path of the stroke on the virtual keyboard (chapter 3.7.1, "spatial relations with the individual characters position on the keyboard") and the time spent inputting the stroke (paragraph [0207], "every time one stroke is inputted") to produce an output (paragraph [0204], "display") of the at least one location channel (paragraph [0207], "character string").

Regarding claim 45, Regarding claim 1, Kristensson discloses a method of recognizing words (chapter 3.6, "SHARK system"), comprising: defining word patterns of a plurality of known words by a plurality of paths (chapter 3.7.1, "word level gestures"; Appendix D), wherein each path connects elements in a word on a virtual keyboard (chapter 3.7.1, "spatial relations with the individual characters position on the keyboard"), wherein the virtual keyboard contains a set of characters forming elements in the word without temporary target letters being

placed adjacent to a current stroke location (chapter 3.7.1, “do not contain … reproduce an exact pattern on the keyboard”); accepting a stroke as an input on the virtual keyboard layout (chapter 3.7.1, “… shorthand gestures … keyboard”); and processing the stroke using a combination of a plurality of channels (chapter 6.1.2, “partial location dependence; chapter 4, “shape”) that selectively process different aspects of the stroke in relation to the plurality of the paths on the virtual keyboard (chapter 3.7.1, “spatial relations with the individual characters position on the keyboard”); using path location (chapter 6.1.2, “partial location dependence”) regarding sampling points of the stroke as one channel of the plurality of the channels (Section 4.3.1, “Non-destructive interpolation”); using normalized shape information (chapter 4, “shape”) independent of location and scale (Section 4.3.1, “Non-destructive interpolation” and “the shape does not consider location or scale”) as another channel of the plurality of channels. However, Kristensson does not disclose all the claim limitations. Instead of Kristensson, Kawamura discloses converting (paragraph [0099], “character segmenting result”) each different aspects of the stroke’s (paragraph [0099], “strokes”) similarity *paragraph [0099], “… corresponding ...") to probability estimates (paragraph [0099], “probability (likelihood"); measuring time spent inputting the stroke (paragraph [0207], “every time one stroke is inputted”); and mathematically integrating the probability (equation (1); “probability density function”) estimates of the plurality of channels to produce integrated probability estimates of candidate words (paragraph [0163], "... calculation of likelihood"), wherein time information (paragraph [0207], “every time one stroke is inputted”)

is used to adjust a relative weight (paragraph [0205], "recognized result") between the path location channel and the normalized path shape channel in the mathematical integration of the probability estimates (equation (1); "probability density function") of the two channel.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kawamura's invention in Kristenesson's invention to automatically recognize characters as suggested by Kawamura (paragraph [0013]).

Regarding claims 46-48, claims 46-48 are analogous and correspond to claims 10-12, respectively. See rejection of claims 10-12 for further explanation.

Regarding claims 49-55, claims 49-55 are analogous and correspond to claims 43, 4-5, 2 and 6-7, respectively. See rejection of claims 43, 4-5, 2 and 6-7 for further explanation.

3. Claims 30-32 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kristensson ("Design and Evaluation of a Shorthand Aided Soft Keyboard") in view of Kawamura et al. (US 2002/0071607), and further in view of Milewski et al. ("Medical Word Recognition Using a Computational Semantic Lexicon").

Regarding claim 30, Kristensson and Kawamura disclose all the claim limitations of the previous claim except the one specified in claim 30. However, Milewski teaches wherein the word patterns are based on a lexicon, and wherein the lexicon comprising a very large collection of words used in a natural

language (“the recognition method deals with medical forms that contain lots of medical words (pages 401-402)”).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Kawamura’s invention and Milewski’s method in Kristensson’ method to provide a hybrid semantic network as suggested by Milewski (page 402).

Regarding claim 31, Milewski further teaches wherein the word patterns are based on a lexicon, and wherein words in the lexicon are rank ordered by usage frequency, and more frequent words are given higher priori probability (“a lexicon database will contain a list of English and medical words which are weighted according to the popularity of that word over time (page 402)”).

Regarding claim 32, Milewski further teaches wherein the word patterns are based on a lexicon, wherein lexicon is customized from an individual user's documents ("a priori data will be used for further recognition in the larger handwriting regions (page 402)”) for a specific application, and wherein part of the customized lexicon is based on a computer programming language (“a data complier, a graphic user interface (GUI), and a Java Constrained Object Inference Net (page 402)”).

Regarding claim 35, Milewski further teaches wherein the word patterns are based on a lexicon, and wherein the lexicon is customized for a specific domain (“the objective and comments region contain lots of varying abbreviations, symbols, and numbers in conjunction with regular handwriting, and a general path can be used to narrow in on specific problems (page 402)”).

Conclusion

4. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN Wahnkyo LEE whose telephone number is (571)272-9554. The examiner can normally be reached on Monday - Friday (Alt.) 7:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on (571) 272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John Wahnkyo Lee/
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